# ABOUT YOUR POWER SUPPLY

## HOUSEHOLD POWER LINES

Lionel electric trains and accessories operate on low voltage ranging from 8 volts to 18 volts, depending on the type and size of the locomotive and train and on the rated voltage of the lamps used in illuminated accessories. This low voltage is generally stepped down from the regular house power lines by means of a Lionel transformer.

While the house power supply used in this country is usually 110 to 125 volts, 60-cycle alternating current (AC), there are a number of exceptions. Some parts of California use 50-cycle current; some areas in Canada employ 25-cycle current, while some downtown areas in New York City still use 110-volt direct current (DC) with which a transformer cannot be used without a special DC-to-AC *inverter*.

Figure 60—Transformer Rating

The regular Lionel transformers are designed to work on 110 to 125-volt, 60-cycle, alternating current. Other combinations of voltage and frequency (cycles) require special transformers which are available although they may not be listed in the general catalogue. The voltage and frequency ratings of transformers always appear on the transformer panel. They must correspond to the rating of your power line, or the transformer may be severely damaged. In case of doubt always ask your electric company about the type of power you have before buying or installing any equipment which is to be plugged into your wall outlets. If you have a special problem consult your Lionel Dealer or write to The Lionel Corporation.

## VOLTAGES SUPPLIED BY LIONEL TRANSFORMERS

The following chart lists all nominal voltages supplied by the most popular 1950 Lionel transformers.

| | Watts | Posts | Voltage Fixed | Voltage Variable |
|---|---|---|---|---|
| 1033 | 90 | A-B | 5 | |
| | | B-C | 11 | |
| | | A-C | 16 | |
| | | A-U | | 5-16 |
| | | B-U | | 0-11 |
| *1034 | 75 | A-B | 6 | |
| | | B-C | 14 | |
| | | A-C | 20 | |
| | | A-U | | 10-20 |
| | | B-U | | 4-14 |
| RW | 110 | A-C | 9 | |
| | | A-D | 19 | |
| | | B-D | 15 | |
| | | C-D | 10 | |
| | | A-U | | 9-19 |
| | | B-U | | 6-16 |
| KW | 190 | C-D | 14 | |
| | | C-U | 6 | |
| | | D-U | 20 | |
| | | A-U | | 6-20 |
| | | B-U | | 6-20 |
| | | A-C | | 0-14 |
| | | B-C | | 0-14 |
| ZW | 275 | A-U | | 6-20 |
| | | B-U | | 6-20 |
| | | C-U | None | 6-20 |
| | | D-U | | 6-20 |

* This transformer has no built-in whistle controller.



## ABOUT WATTAGE

In addition to their voltage and frequency rating, all transformers also bear a wattage rating. The wattage of a transformer corresponds to its *capacity*, or ability to furnish power. While the voltage and frequency of the transformer you must use are determined by the available power line, the selection of its wattage is guided by the size of your outfit and the number of lights and operating accessories. In planning to expand your railroad always estimate the power you will need to find out if your transformer will be adequate. *It is always wisest to get a transformer larger than the one you require for your immediate needs to provide power for future expansion.*

As a transformer becomes warm when in use its output normally diminishes. Because of this fact not more than three-quarters of its rated wattage should be drawn from a transformer continuously.

## POWER REQUIREMENTS

The following table lists the power in watts used by various model railroad components:

| | |
|---|---|
| "027" locomotive | 25-35* |
| "O" locomotive | 30-40* |
| Smoke generator | 5 |
| Operating accessories | 10-40 |
| Automatic track signals | 10-15 |
| Each 6-volt lamp | 1.5 |
| Each 14-volt lamp (small) | 2. |
| Each 14-volt lamp (large) | 3. |
| Each 18-volt lamp | 5. |

* These wattages are drawn by locomotives when pulling the regular number of cars and include the power used by the whistle. However, you must add the power used by lamps in illuminated cars.

Power requirements of automatic couplers and operating cars need not be added in the total since couplers draw current only for an instant and operating cars only when the train is not running. For the same reason do not add the power used by such accessories as the Lumber and Coal Loaders, Automatic Lift Bridges, and others. All such accessories can be generally used even with the smallest transformers, provided that they are operated when the train is standing still.

Accessory lights and equipment containing steadily burning lamps, such as switches and switch controllers, use a considerable amount of power and should be added in the total power requirements.

The following table can be used as a guide for the selection of additional accessories for your outfit or for a more adequate transformer for your railroad system.

| Transformer | Capacity | Recommended for Operating the Following |
|---|---|---|
| 1033 | 90 watts | One "027" outfit with smoke and whistle; few track or signal accessories. |
| RW | 110 watts | Any "O" outfit with smoke and whistle; few switches and other accessories. |
| KW | 190 watts | Two "O" outfits with smoke, whistle, switches and other accessories. |
| ZW | 275 watts | Any practical railroad system with two or more trains, etc. |